

REMARKS/ARGUMENTS

The drawings are objected to for reference numerals not in the specification. The amendment of the specification is made to avoid this rejection. Since the flat panel lamp illustrated in Figs. 6(a) and 6(b) is prepared in the same manner as Example 1 as described in page 149, line 16 through page 150, line 15, the reference numbers 101 - 107 of Figs. 6(a) and 6(b) are the same as the reference numbers 101 - 107 of Fig. 5. No new matter is introduced.

Claim 1 was amended so as to include the limitations of claims 2 and 5-10. Claims 2 and 5-10 are cancelled.

Claims 3, 4, and 11 were also cancelled.

Claims 12-24 are properly dependent on claim 1 as amended, because these claims can be dependent on any of claims 2 and 5-10 as described in page 13, line 10 through page 15, line 25.

Amendments of claims 17, 23, and 24 were made to correct clerical and typographical errors.

In view of the above, withdrawal of the claim objections is requested.

Claims 18, 19, and 21 were amended to distinctly claim the subject matter according to Item 4 of the Office Action.

New claims 25 - 30 were added.

With respect to Items 3 and 4 of the Office Action, claims 18, 19, and 21 were amended as above.

In claims 18, 19, and 21, the term "carboline derivative" means a compound having a carboline moiety as a substructure in the molecule as shown in compounds 60 - 104 in pages 90 - 99 of the Specification. The term is amended to delete "derivative" since the compound is a carboline as defined in the specification. The anticipation rejection of Claims 1-4, 12, 14, 15, 23 and 24 is avoided by combining dependent claims, not anticipated, into Claim 1. This is also the case with respect to the anticipation rejection of Claims 1, 2, 11, 14 and 15.

Claims 1-4, 7, 8, 14-16, are rejected as anticipated or obvious over Kita et al. (JP 2003/109758 A).

The Examiner states that, in complex 111 ([0082]) of Kita et al., free rotation of the aryl group is blocked by phenyl groups being present on the R₁, R₃ and R₄ positions. However, the phenyl groups being present on the R₁, R₃ and R₄ positions (R₁, R₃ and R₄

being explained in [0082] of Kita et al.) of complex 111 of Kita et al. are not considered to be aryl groups of which free rotation is blocked. The case of the above phenyl groups at R_1 , R_3 and R_4 positions of complex 111 is not included in the examples of an aryl group or an aromatic heterocycle group of which free rotation is blocked in pages 33-46 of the present Specification.

Accordingly, complex 111 of Kita et al. (with $m=1$ and $n=1$ (shown below) as the Examiner discussed in page 6 of the outstanding Office Action) was tested to show that complex 111 of Kita et al. is not the platinum complex within the scopes of claims 7 and 8 of the present Application, namely to show that complex 111 of Kita et al. does not contain an aryl group of which free rotation is blocked, and therefore is not anticipated or obvious over Kita.

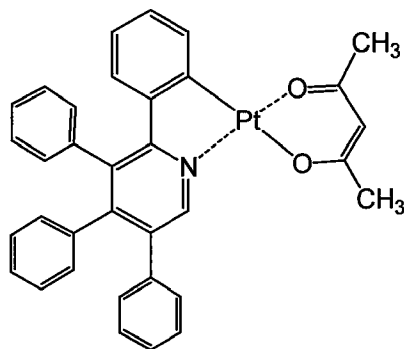
Evidence of this conclusion is shown in the 1.132 Declaration which is filed herewith.

OLED 2-32 employing Complex 111 (with $m=1$ and $n=1$ shown above) in Table 2-continued given in the 1.132 Declaration showed a lower "external quantum efficiency" of 101 and a shorter

"emission life" of 105 compared to those of the inventive samples in Table 2 (in page 143 of the present Application) and Table 2-continued in the 1.132 declaration, suggesting that no phenyl group of which free rotation is blocked is contained in complex 111 ([0082]) of Kita et al.

Accordingly, the rejection of the subject matter of claims 7 and 8 (now incorporated into Claim 1) should be withdrawn.

111



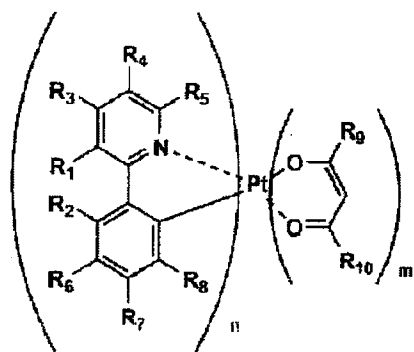
Claims 5 and 6 are rejected as being unpatentable over Kita et al. (JP 2003/109758 A) for reasons as applied to Claim 1 and additional explanation.

The Examiner cited the following two reasons for the rejection of claims 5 and 6.

(1) Kita et al. disclose complex 105 [0082] having a phenyl substituent in the R₂ position.

(2) Kita et al. disclose compound 10 (Table 1 [0048] page 8) having phenyl and methyl groups in the R1 and R2 positions of the same ligand.

With respect to above (1), the phenyl substituent in the R₂ position of compound 105 (see below) is not a phenyl group of which free rotation is blocked, since the phenyl group in the R₁ position of complex 111 (see below) is not a phenyl group of which free rotation is blocked as discussed above (complex 111 contains no phenyl group of which free rotation is blocked as discussed above).



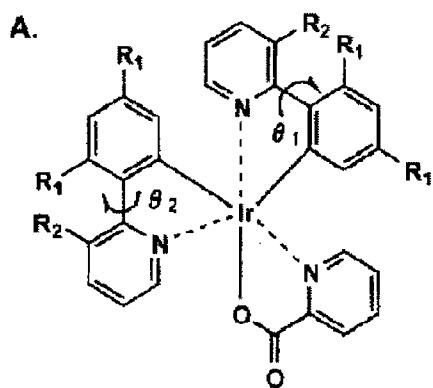
	n	m	R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	R ₇	R ₈	R ₉	R ₁₀
105	3	1	H	Ph						CH ₃	CH ₃	
111	3	1	Ph	H	Ph	Ph				CH ₃	CH ₃	

With respect to above (2), compound 10 of Kita et al. is an iridium complex and Kita et al. disclose no platinum complex having phenyl and methyl groups in the R_1 and R_2 positions, R_1 and R_2 being illustrated below. The Examiner also states, in pages 8 of the outstanding Office Action, that it would be obvious to one of ordinary skill in the art at the time of the invention to reverse the phenyl and methyl groups of R_1 and R_2 in the ligand of compound 10 and use the ligand as part of a platinum complex resulting in a complex of instant formulae (3) and (4).

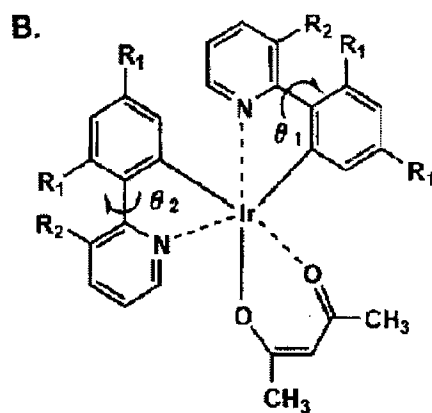
Accordingly, the properties of the platinum complex having phenyl and methyl groups in the R_1 and R_2 positions was tested to show that unexpected superiority of the platinum to the properties of compound 10 of Kita et al., which is an iridium complex, when these compounds are used in an organic EL element.

The properties of following platinum complexes 10-C and 10-D having the same ligands as A and B, respectively, of compound 10 of Kita et al. ([0043]) were compared with following iridium complexes 10-A and 10-B which correspond to A and B of compound 10 of Kita et al., in the organic EL elements.

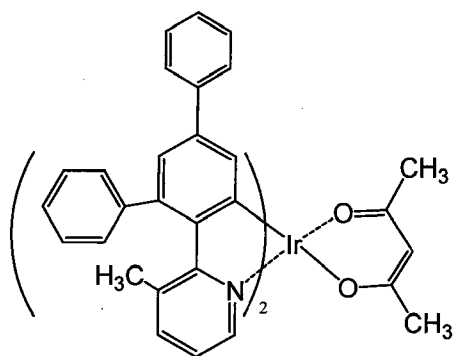
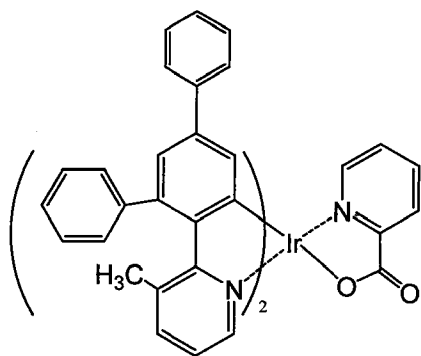
Compound 10 of Kita et al.: with $R_1 = -\text{Ph}$ and $R_2 = -\text{CH}_3$



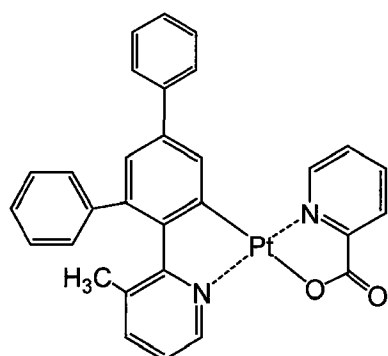
10-A



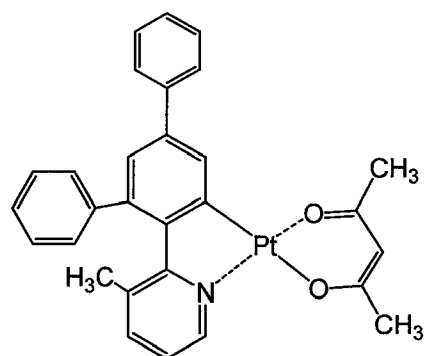
10-B



10-C



10-D



The results are shown in the 1.132 declaration filed herewith.

Unexpectedly superior properties of platinum complexes having the same ligands as A and B of compound 10 of Kita et al.([0043]).to the properties of iridium complexes A and B of compound 10 of Kita et al.([0043]), when these complexes were used in the organic EL elements, were clearly demonstrated in Table 2-continued. Namely, OLED2-35 and OLED2-36 employing complexes 10-C and 10-D having the same ligands as A and B, respectively, of compound 10 of Kita et al.([0043]) exhibited higher "external quantum efficiencies" and longer "emission lives" than those of OLED2-33 and OLED2-34 employing complexes

10-A and 10-B which correspond to above A and B of compound 10 of Kita et al. ([0043]).

According to the above discussion, the platinum complexes represented by Formulas (3) and (4) of the present Application are not obvious over Kita et al.

Accordingly, the rejections of claims 5 and 6 should be withdrawn.

Claims 1, 2, 9, 14 and 15 are rejected as being unpatentable over Kamatani et al. (US 2003/0059646 A1). also a rejection of Claim 10 is discussed although not included in the Item 12 rejection.

The Examiner states, in pages 10 of the outstanding Office Action, that the reference (Kamatani et al.) does not explicitly disclose the carbazolyl substituent bound to the R₁ position, however, such a compound would be a positional isomer of the explicitly disclosed complexes of Kamatani et al. and that compounds which are position isomers are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties.

However, with respect to the rotation of such a large substituent of carbazole, the R_1 position of the partial structure Ph in [0082] page 6 of Kamatani et al. (see below) is quite different from the R_2 and R_3 positions of the same partial structure Ph because of the steric hindrance due to the neighboring pyridine ring P1 shown in page 8 of Kamatani et al., (see below) when a pyridine ring P1 is attached to the partial structure Ph as in compounds 36 and 38 in page 9 of Kamatani et al. (see below). In Compound 12 in page 35 of the present Application, a carbazolyl substituent bound to the position corresponding to the above R_1 position of the partial structure Ph of Kamatani et al. is cited as one of the examples of an aromatic heterocycle of which free rotation is blocked, while a carbazolyl substituents bound to the positions corresponding to the R_2 and R_3 positions of the same partial structure Ph of Kamatani et al. are not included as such examples.

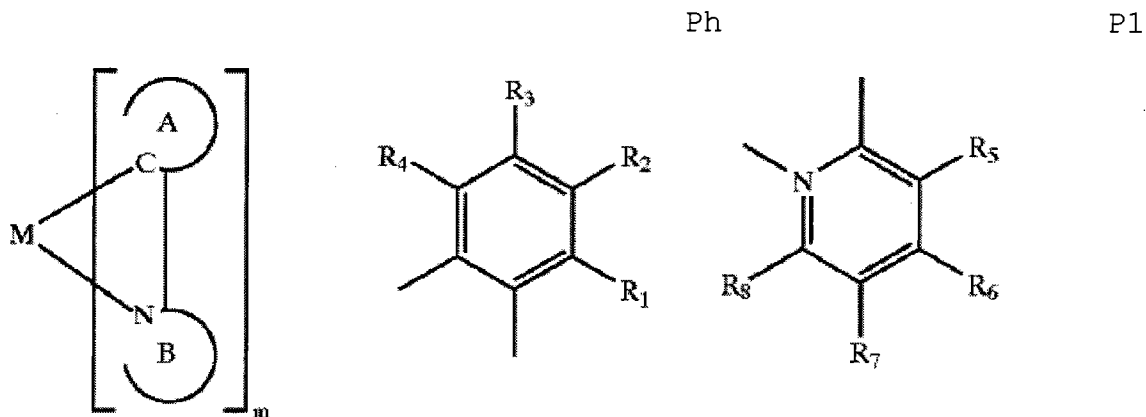
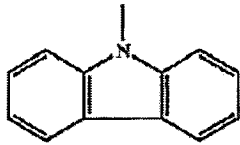
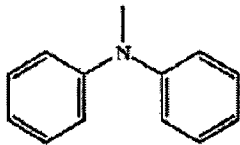
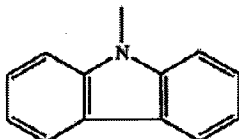


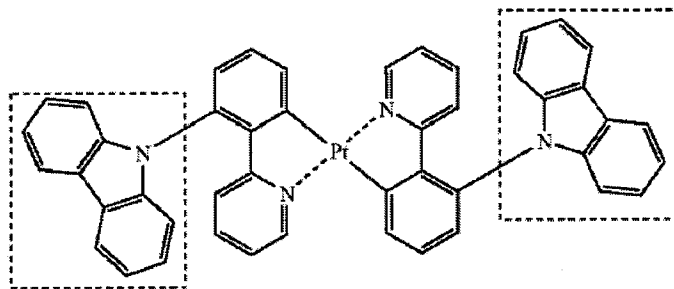
TABLE 1-1

No	M	m	n	A	B	A-R1	A-R2	A-R3	A-R4	B-R5	B-R6	B-R7	B-R8
36	Ir	3	0	Ph	P1	H		H	H	H	H	H	H
37	Ir	3	0	Ph	P1	H		H	H	H	H	H	H
38	Ir	3	0	Ph	P1	H	H		H	H	H	H	H

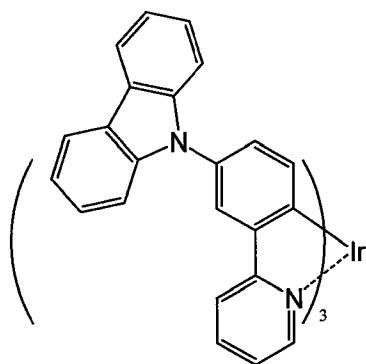
Accordingly, the properties of compound 12 in page 45 of the present Application (see below) having a carbazoyl substituent bound to the position corresponding to the above R₁ position with the properties of following compounds 12-A and 12-B which correspond to compound 36 and 38, respectively, in page 9 of Kamatani et al. (see above) having carbazoyl substituents bound to the above R₂ and R₃ positions, respectively, in the organic EL elements to show that the free rotation of a carbazoyl substituent bound to the R₁ position of the partial structure Ph

of Kamatani et al. is blocked, while the rotation of carbazoly1 substituents bound to the R₂ and R₃ positions of the same partial structure are free.

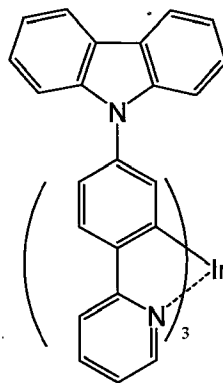
12



12-A



12-B



The results are shown in the 1.132 declaration.

OLED2-37 employing Complex 12 in page 45 of the present Application showed a higher "external quantum efficiency" and a longer "emission life" compared to those of OLED2-38 and OLED2-39, OLED2-38 employing above complex 12-A having a carbazoyl group in the R₂ position of the partial structure Ph in [0082] page 6 of Kamatani et al. and OLED2-39 employing above complex 12-B having a carbazoyl group in the R₃ position of the same partial structure Ph of Kamatani et al. The above result suggests that the rotation of the carbazoyl substituent bound to the R₁ position is blocked, while the rotation of the carbazoyl substituents bound to the R₂ and R₃ positions are free.

Accordingly, neither of compounds 36 and 38 in page 9 of Kamatani et al. each having a carbazoyl group in the R₂ and R₃ positions, respectively, of the partial structure Ph of Kamatani et al. disclose a complex having a carbazoyl group of which free rotation is blocked.

Accordingly, the rejections of Claims 1, 2, 9, 14 and 15, should be withdrawn.

The rejection of Claims 16 and 17 in Item 13 (page 12-13) is over Sato et al in view of Kita et al. Kita is again relied on

to show an ortho-metallated platinum complex wherein free rotation of an aryl group is blocked (as in the earlier rejection). Similar reliance on Kita is in the rejection in Items 14 (Claim 18), 15 (Claim 19), 16 (Claim 20), 17 (Claim 21), and 18 (Claim 22). However, the additional art relied on does not change the essential teaching of Kita and that it does not support the Examiner's essential interpretation as to the disclosure, as detailed alone and with respect to the Declaration filed herewith.

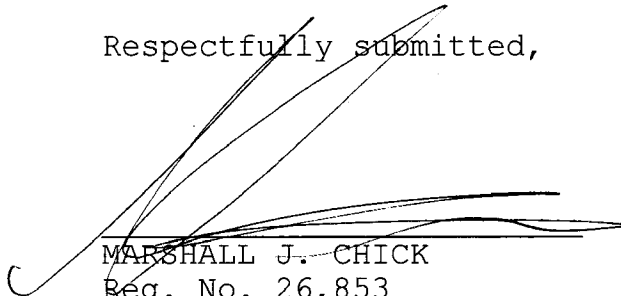
Claims 1-11, 15, 18, 23, and 24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting over claims 1, 2, 9, 13, 18-43, 45, and 46 of copending Application No. 11/632389. This seems premature since the priority date and U.S. filing date of the present Application are earlier than those of Application No. 11/632389. However, if it is necessary to overcome the rejection, a terminal disclaimer will be filed.

In view of the above, the rejections are avoided. Allowance of the application is therefore respectfully requested.

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Reply to Office Action of October 1, 2009

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Enc. IDS and Fee
Declaration Under 1.132